Histology of Endocrine System II

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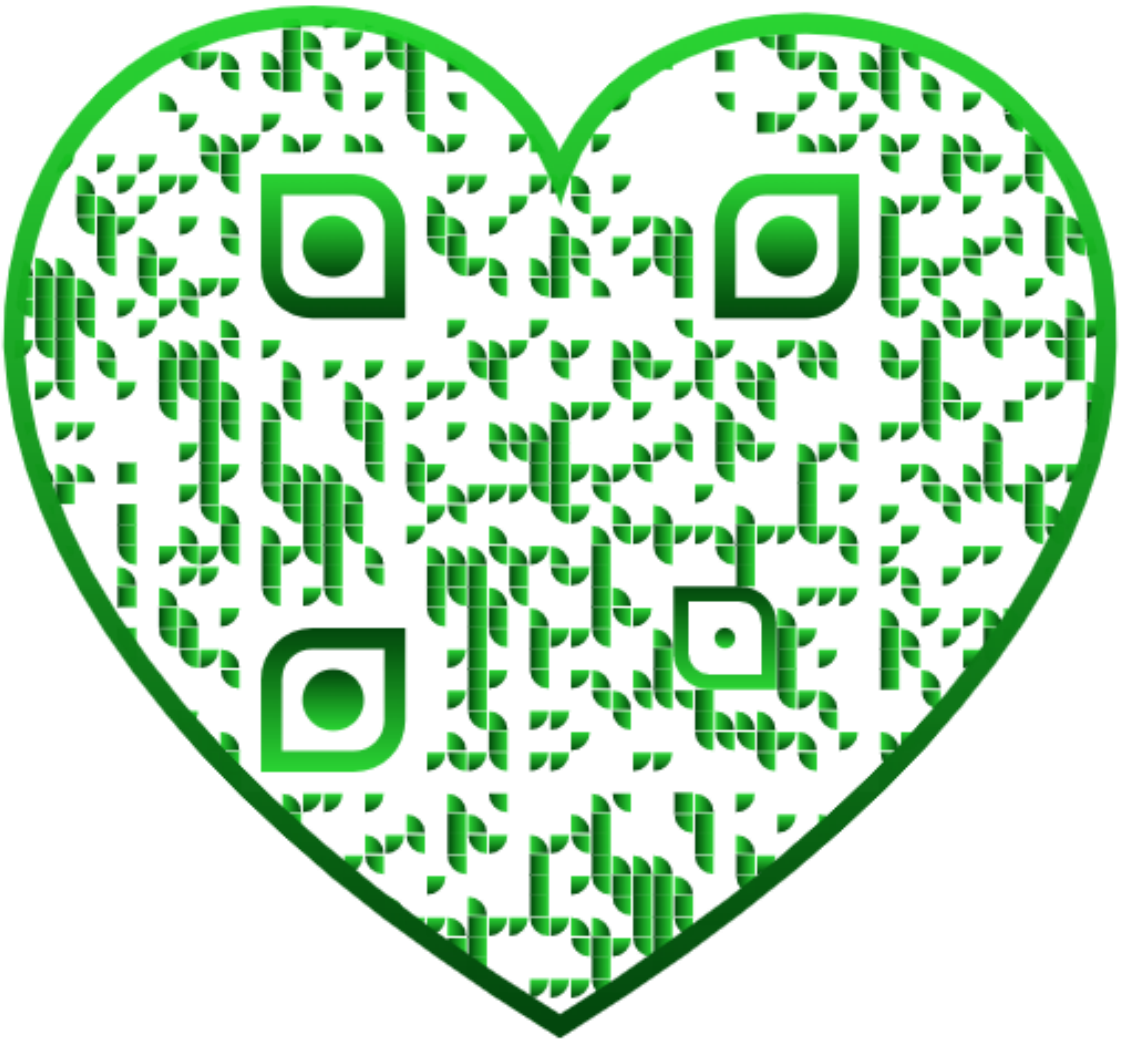
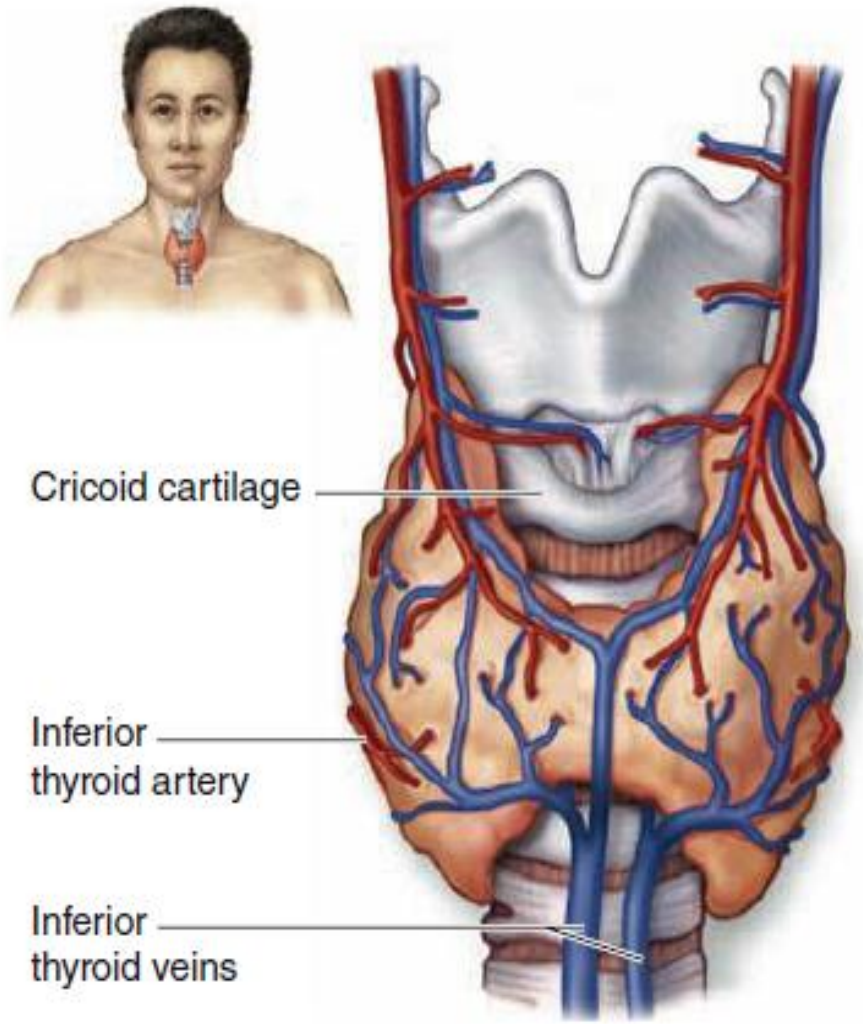


Thyroid gland

- The **thyroid gland** consists mainly of spherical **follicles** composed of simple epithelium of **thyrocytes** surrounding a lumen with **thyroglobulin**.
- **Thyroglobulin** is a large glycoprotein in which tyrosine residues are **iodinated** as precursors of the thyroid hormones **thyroxine** and **triiodothyronine**, which are released when the precursor is degraded.
- Thyroid follicles also contain a few smaller and paler cells called **parafollicular cells**, or **C cells**, which produce the polypeptide hormone **calcitonin**.

FIGURE **20–18** **Thyroid gland.**



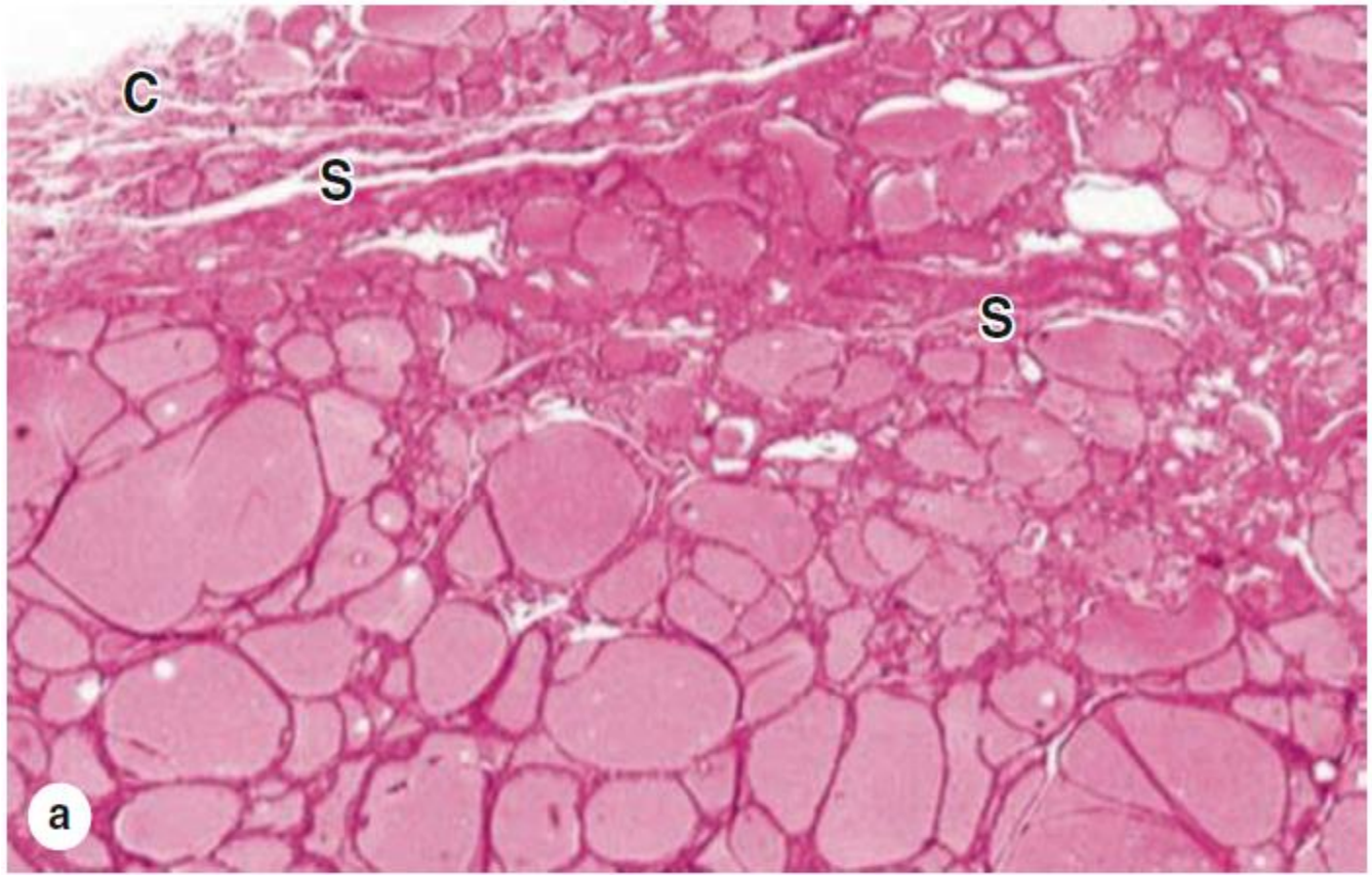
The thyroid is a highly vascular, butterfly-shaped gland surrounding the anterior surface of the trachea just below the larynx.

A low-power micrograph of thyroid gland shows the thin **capsule (C)**, from which **septa (S)** with the larger blood vessels, lymphatics, and nerves enter the gland.

The parenchyma is consisting of colloid-filled epithelial follicles of many sizes. The lumen of each follicle is filled with a lightly staining colloid of a large gelatinous protein called **thyroglobulin**.

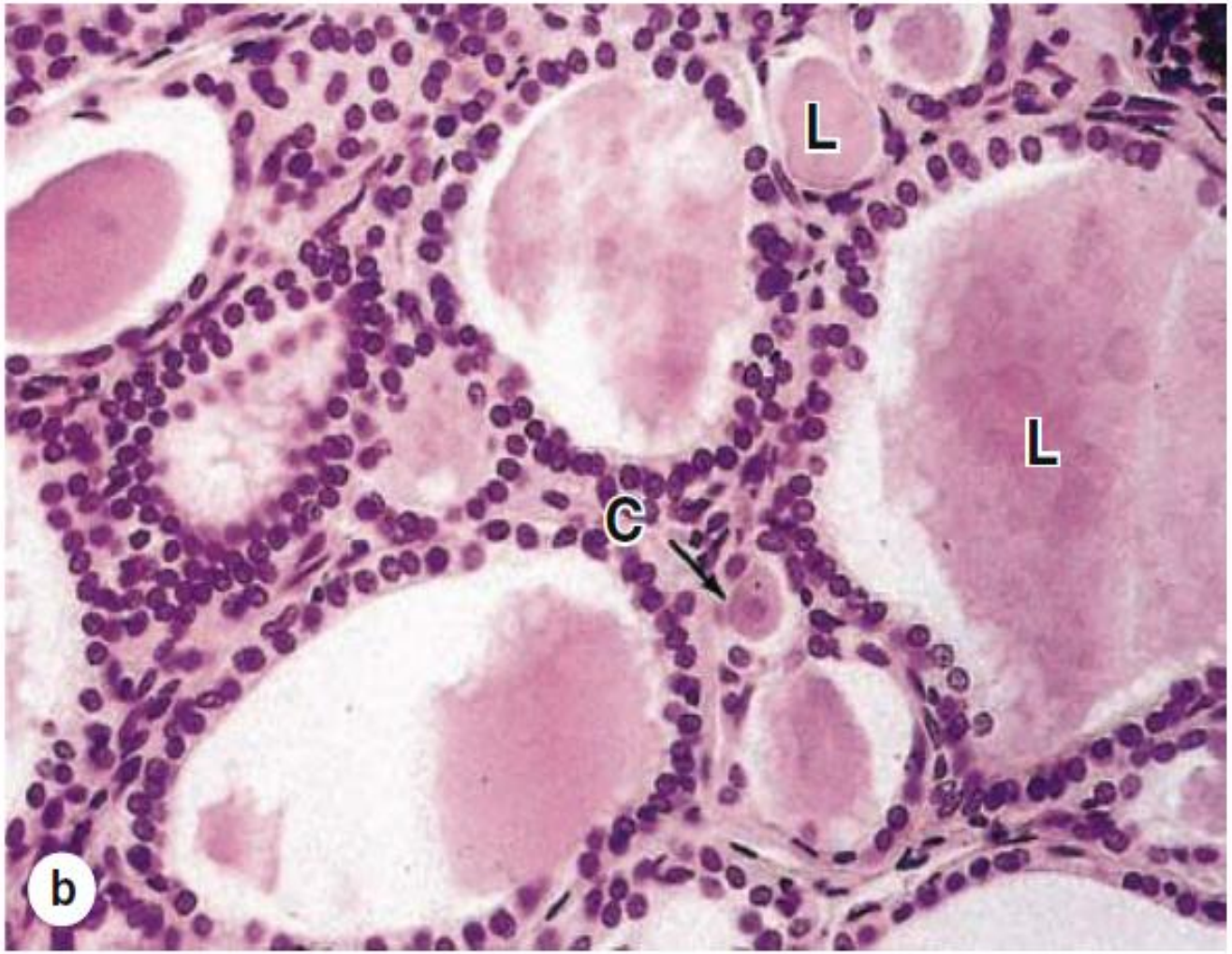
Stain: H&E

FIGURE **20–19** **Thyroid follicular cells and parafollicular cells.**



The lumen (**L**) of each follicle is surrounded by a simple epithelium of thyrocytes in which the cell height ranges from squamous to low columnar. Also present are large pale-staining parafollicular or C cells (**C**) that secrete calcitonin, a polypeptide involved with calcium metabolism.

Stain: H&E

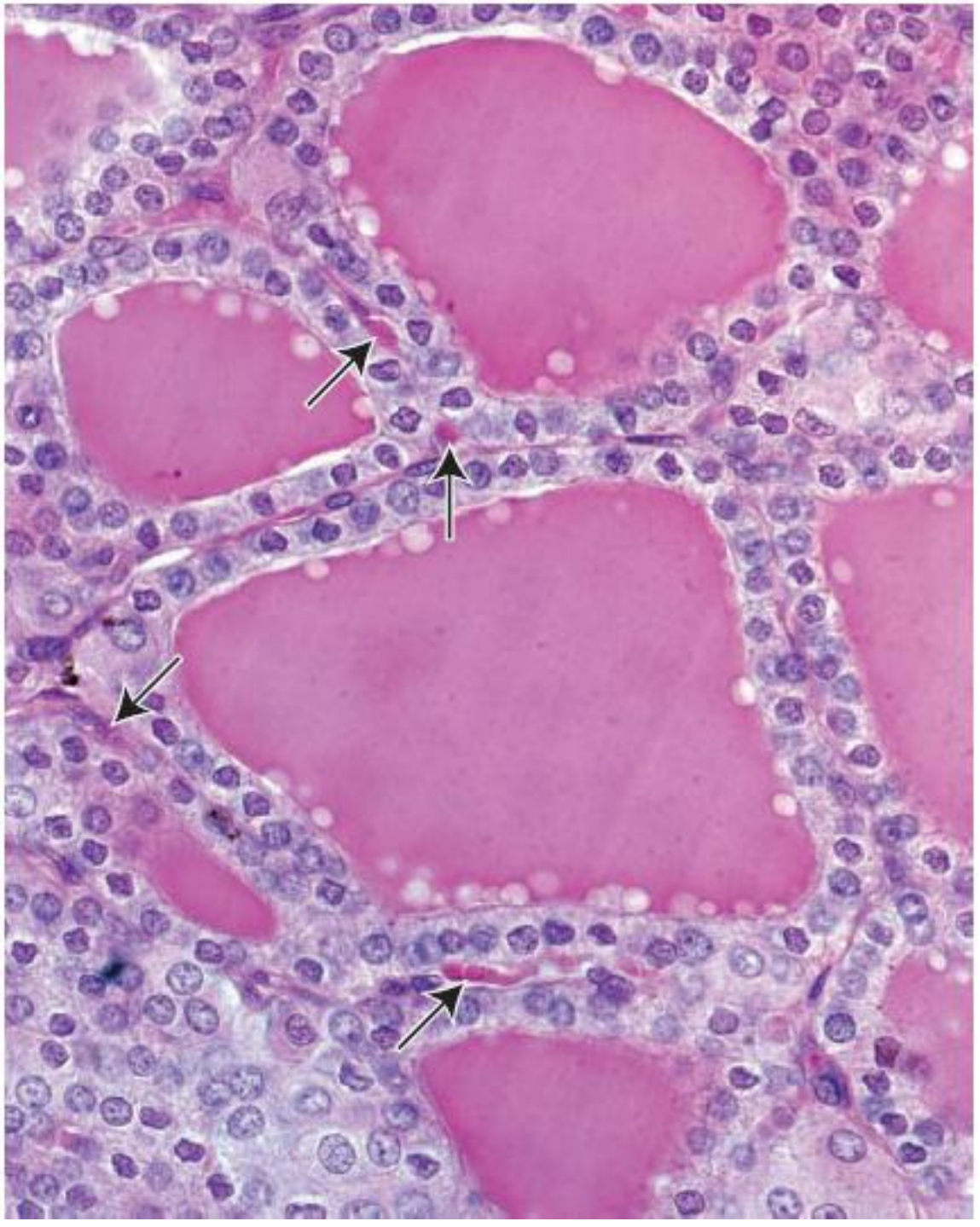


Thyroid gland

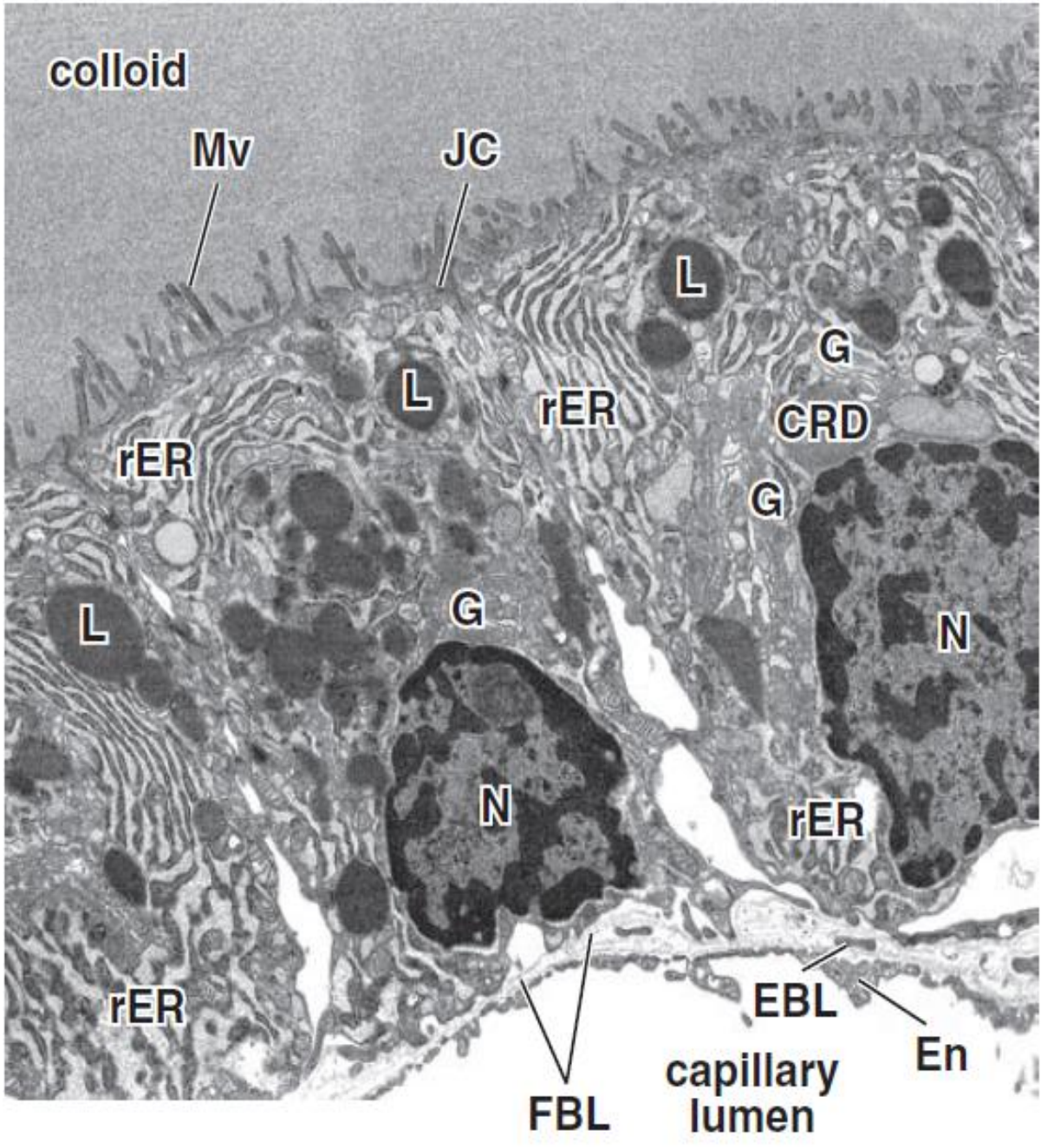
This photomicrograph shows the colloid-containing follicles of the gland. Each follicle consists of a single layer of epithelial cells surrounding a central mass of colloid.

The *arrows* indicate some of the blood capillaries between the follicles.

Stain: H&E

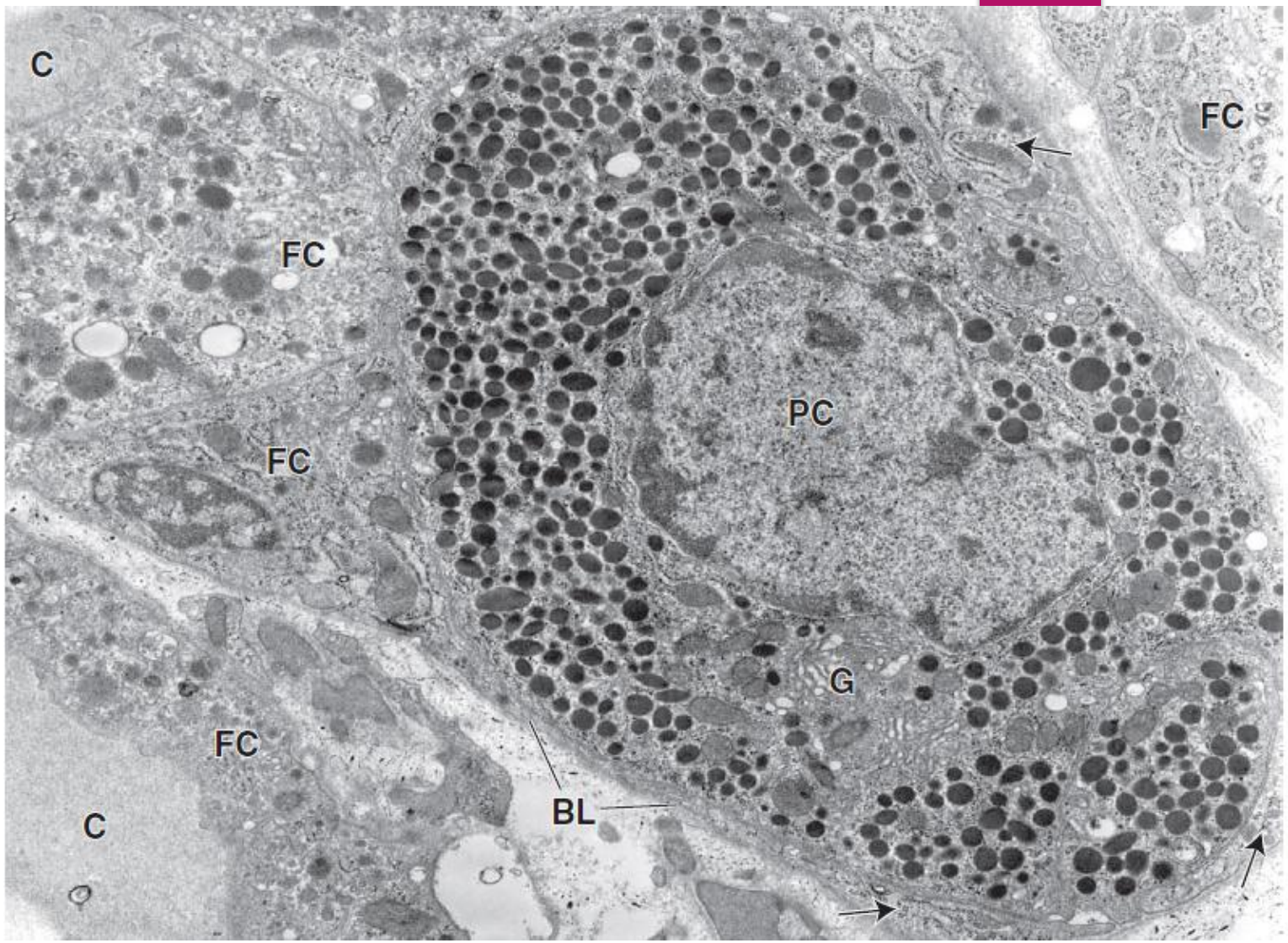


Electron micrograph of follicular cells in rat thyroid gland. This electron micrograph shows a single layer of epithelium containing low columnar follicular cells. The apical surfaces with visible microvilli (*Mv*) are in contact with the colloid, whereas basal surfaces of follicular cells rest on the basal lamina (*FBL*). A narrow extracellular connective tissue space separates the follicular cells from the lumen of the capillary. Note that the fenestrated endothelial cells (*En*) lining capillary lumen rest on the basal lamina (*EBL*). Accumulation of lysosomes (*L*) and colloid resorption droplets (*CRD*), extensive Golgi apparatus (*G*), rough endoplasmic reticulum (*rER*), and presence of enlarged intercellular spaces are indicative of intensive activity of follicular cells.



Electron micrograph of a parafollicular cell.

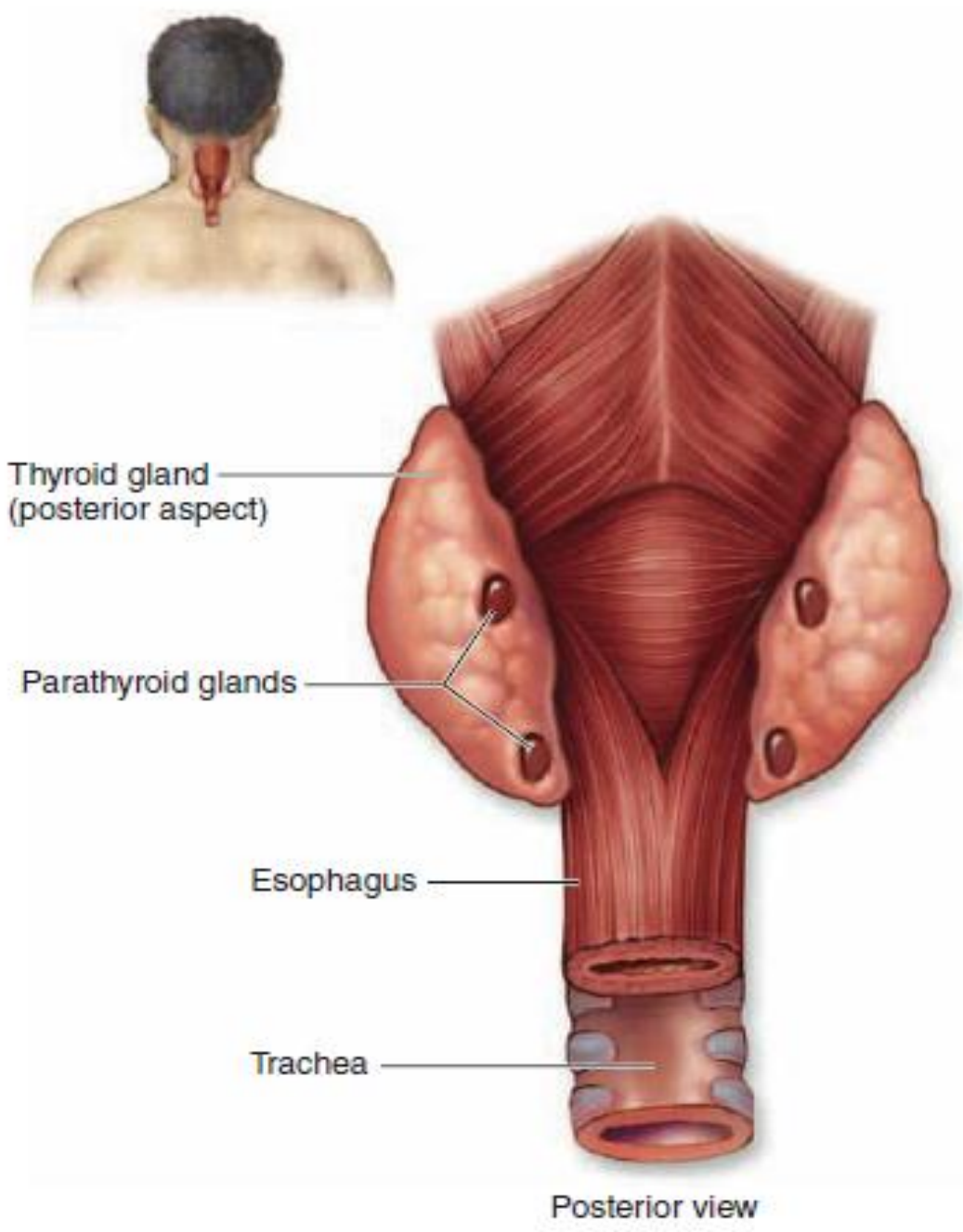
Cytoplasmic processes of follicular cells (*arrows*) partially surround the parafollicular cell (*PC*), which contains numerous electron-dense granules and a prominent Golgi apparatus (*G*). A basal lamina (*BL*) is associated with the follicular cells (*FC*). A portion of the central mass of colloidal material (*C*) in two adjacent follicles can be seen in the left corners of the micrograph. 12,000. (Courtesy of Dr. Emmanuel-Adrien Nunez.



Parathyroid Gland

- The parathyroid glands are four small nodules normally embedded in the capsule on the posterior surface of the thyroid gland.
- Four small **parathyroid glands**, each consisting primarily of **principal cells** that secrete **parathyroid hormone** (**PTH**) that raises blood Ca_{2+} levels.

FIGURE **20–22** **Parathyroid glands.**



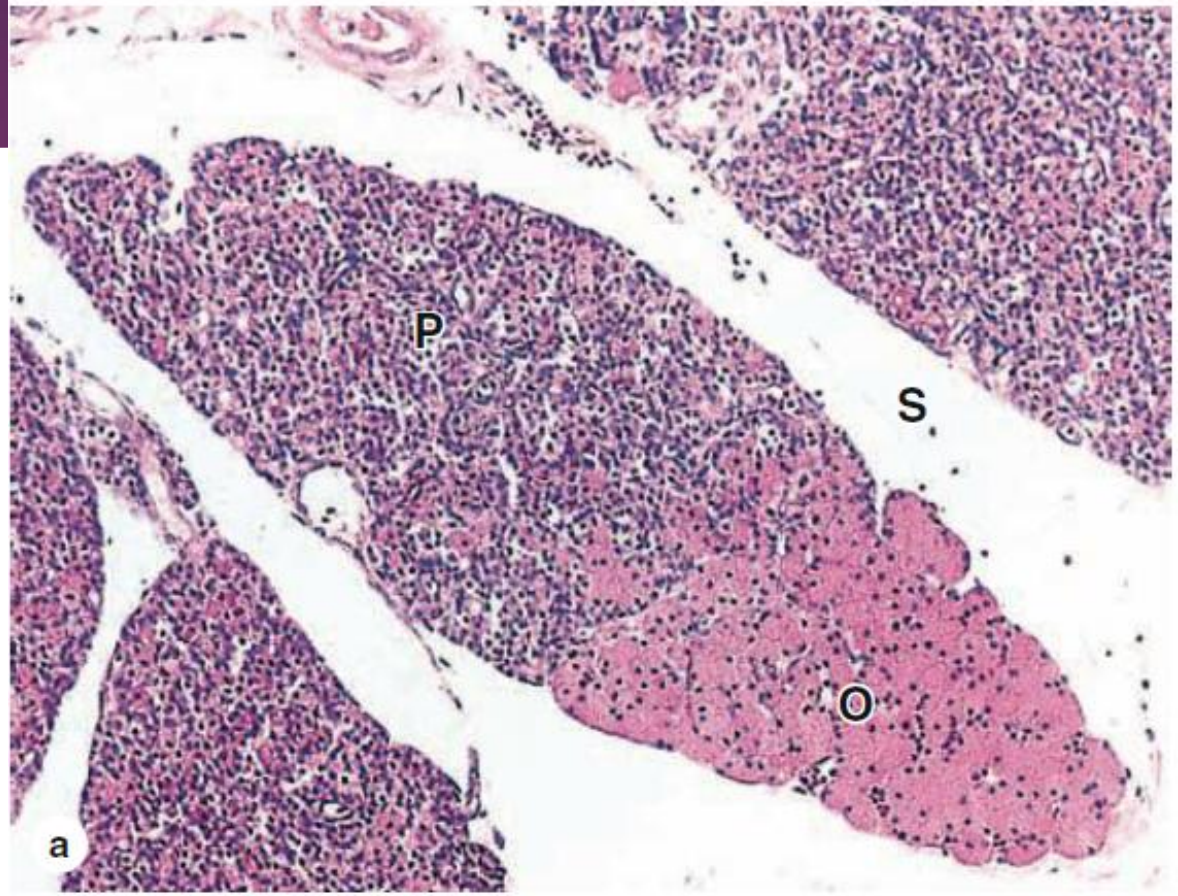
Parathyroid gland

A small lobe of parathyroid gland, surrounded by connective tissue septa (**S**), shows mainly densely packed cords of small principal cells (**P**).

Older parathyroid glands show increasing numbers of much larger and acidophilic nonfunctional oxyphil cells (**O**) that may occur singly or in clumps of varying sizes.

- Stain: H&E

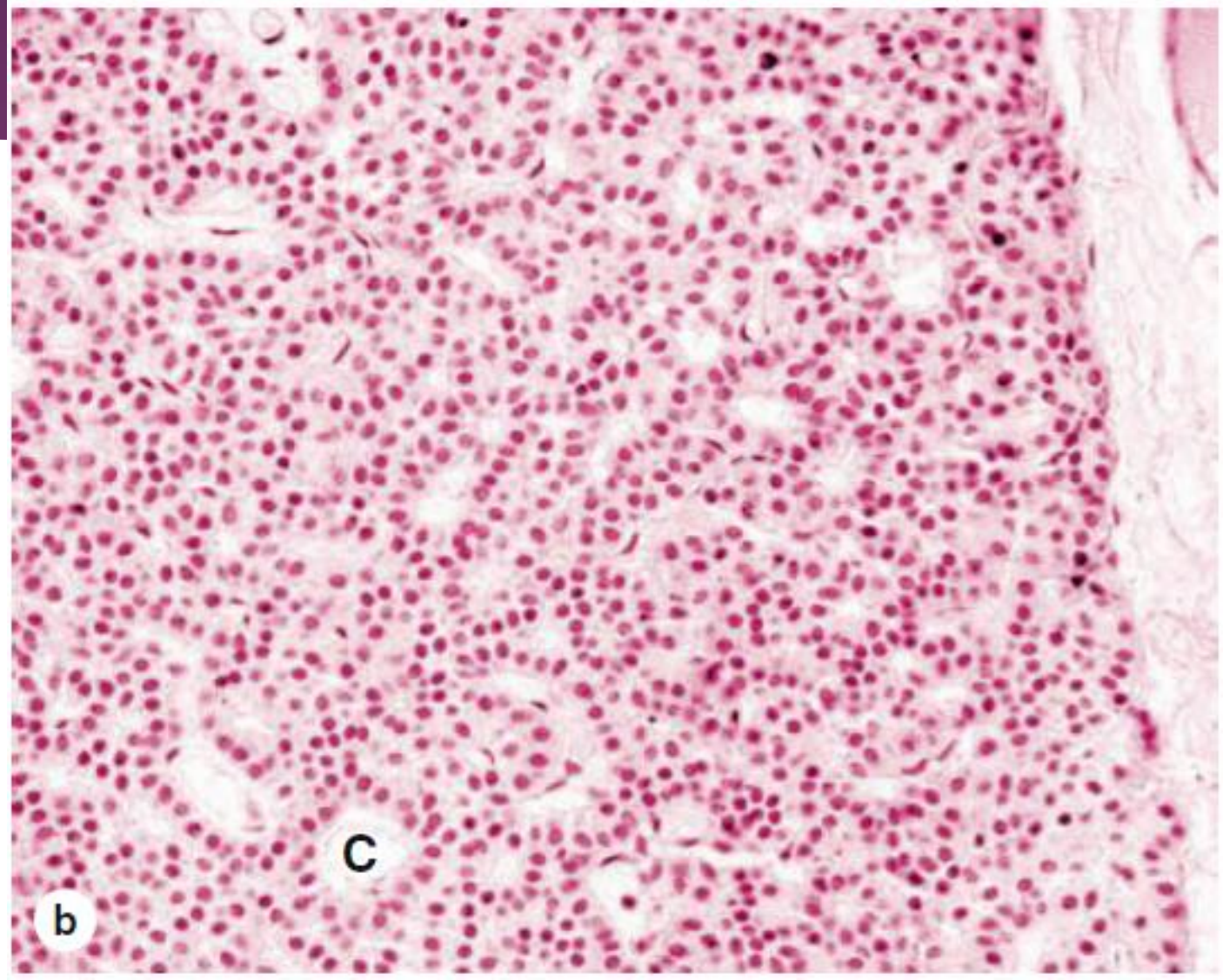
FIGURE **20–23** **Parathyroid principal cells.**



Parathyroid

Higher magnification shows that principal cells have round central nuclei and pale-staining cytoplasm. Cords of principal cells secreting PTH surround capillaries (**C**).

Stain: H&E



Thank you..